

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:

KANG S. LIM
3494 CAMINO TASSAJARA ROAD, #436
DANVILLE, CA 94506

PCT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT AND
THE WRITTEN OPINION OF THE INTERNATIONAL
SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing
(day/month/year)

26 FEB 2008

Applicant's or agent's file reference

DT-0604-PCT

FOR FURTHER ACTION See paragraphs 1 and 4 below

International application No.

PCT/US 07/20678

International filing date
(day/month/year)

25 September 2007 (25.09.2007)

Applicant DEMANDTEC, INC.

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes
1211 Geneva 20, Switzerland, Facsimile No.: +41 22 740 1435

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. Reminders

Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450, Alexandria, Virginia 22313-1450
Facsimile No. 571-273-3201

Authorized officer

Lee W. Young
Lee W. Young

PCT Helpdesk: 571-272-4300
PCT OSP: 571-272-7774

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

| | | | |
|--|--|---|---|
| Applicant's or agent's file reference DT-0604-PCT | FOR FURTHER ACTION | | see Form PCT/ISA/220 as well as, where applicable, item 5 below. |
| International application No. PCT/US 07/20678 | International filing date (day/month/year) 25 September 2007 (25.09.2007) | (Earliest) Priority Date (day/month/year) 25 September 2006 (25.09.2006) | |
| Applicant DEMANDTEC, INC. | | | |

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of:

- ☒ the international application in the language in which it was filed.
☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☐ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

- ☒ the text is approved as submitted by the applicant.
☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- ☒ the text is approved as submitted by the applicant.
☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

- a. the figure of the **drawings** to be published with the abstract is Figure No. 1
☐ as suggested by the applicant.
☒ as selected by this Authority, because the applicant failed to suggest a figure.
☐ as selected by this Authority, because this figure better characterizes the invention.
- b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 07/20678

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - G06Q 20/00 (2007.10)

USPC - 705/20

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

USPC: 705/20

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC: 705/1,14,20,34,35; 706/46,47,925.ccls. (text search - see terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PubWEST(USPT,PGPB,EPAB,JPAB); Google Scholar; Google

Search Terms Used: promotion, markdown, sell, price, charge, cost, revenue, project, estimate, optimize, reduce, schedule, calendar, tune, adjust, update, feedback, periodic, week, daily

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------------|---|--|
| X ----- Y | US 7,092,929 B1 (DVORAK et al.) 15 August 2006 (15.08.2006), Fig 18, 19, and 20 col 4, ln 16-25; col 6, ln 62-67; col 7, ln 1-26; col 8, ln 65-67; col 9; col 14, ln 54-67; col 15, ln 1-24; col 30, ln 14-39 | 1-7, 24-25, 37-43 ----- 8-23 and 26-36 |
| Y | US 2003/0220830 A1 (MYR) 27 November 2003 (27.11.2003), para [0194]-[0202] | 8, 21, 26-36 |
| Y | US 2003/0200185 A1 (HUERTA et al.) 23 October 2003 (23.10.2003), para [0041] | 9-10, 16,17, 23, 31-32 |
| Y | US 2006/0161504 A1 (WALSER et al.) 20 July 2006 (20.07.2006), para [0010], [0015] and [0037]-[0038] | 9, 11-15, 31, 33-36 |
| Y | US 2005/0096963 A1 (MYR et al.) 05 May 2005 (05.05.2005), para [0056] and [0206] | 15, 36 |
| Y | US 2003/0028437 A1 (GRAEME et al.) 06 February 2003 (06.02.2003), para [0065] and [0094]-[0095] | 18-20, 22 |

☒ Further documents are listed in the continuation of Box C.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

Date of mailing of the international search report

26 FEB 2008

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents

P.O. Box 1450, Alexandria, Virginia 22313-1450

Facsimile No. 571-273-3201

Authorized officer

Lee W. Young

PCT Helpdesk: 571-272-4300

PCT OSP: 571-272-7774

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 07/20678

| C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT | | |
|---|---|-----------------------|
| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| A | KAY E., DemandTec News and Events, [online] September 2003 [retrieved 2007-12-28], retrieved from the internet <URL: http://www.demandtec.com/news/articles2003/news_art_20030901_Fmtline.htm >, entire document | 1-43 |

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: KANG S. LIM
3494 CAMINO TASSAJARA ROAD, #436
DANVILLE, CA 94506

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing
(day/month/year)

26 FEB 2008

Applicant's or agent's file reference
DT-0604-PCT

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/US 07/20678

International filing date (day/month/year)

25 September 2007 (25.09.2007)

Priority date (day/month/year)

25 September 2006 (25.09.2006)

International Patent Classification (IPC) or both national classification and IPC

IPC(8) - G06Q 20/00 (2007.10)

USPC - 705/20

Applicant DEMANDTEC, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/US
Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450, Alexandria, Virginia 22313-1450
Facsimile No. 571-273-3201

Date of completion of this opinion

29 December 2007 (29.12.2007)

Authorized Officer

Lee W. Young

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US 07/20678

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed.
 - ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of:
 - a. type of material
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material
 - ☐ on paper
 - ☐ in electronic form
 - c. time of filing/furnishing
 - ☐ contained in the international application as filed
 - ☐ filed together with the international application in electronic form
 - ☐ furnished subsequently to this Authority for the purposes of search
4. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US 07/20678

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | | |
|-------------------------------|--------|-------------------|-----|
| Novelty (N) | Claims | 8-23, 26-36 | YES |
| | Claims | 1-7, 24-25, 37-43 | NO |
| Inventive step (IS) | Claims | None | YES |
| | Claims | 1-43 | NO |
| Industrial applicability (IA) | Claims | 1-43 | YES |
| | Claims | None | NO |

2. Citations and explanations:

Claims 1-7, 24-25, and 37-43 lack novelty under PCT Article 33(2) as being anticipated by US 7,092,929 B1 to Dvorak et al. (hereinafter Dvorak).

As per claim 1, Dvorak teaches an apparatus for providing relative optimized pricing for a plurality of markdown items for at least one store (see col 9, ln 40-67), comprising: a financial engine for determining revenue for determining sales costs (see col 6, ln 62-67; col 7, ln 1-26; and col 9, ln 40-67); an optimization engine receiving input from the financial engine for using the determined sales costs and providing relative optimized pricing for markdown items (see col 6, ln 62-67; col 7, ln 1-26; and col 9, ln 40-67) and provides pricing and a promotion calendar for non-markdown items (see col 8, ln 65-67; col 9, ln 1-28), comprising an engine for providing non-markdown item pricing (see col 14, ln 54-67; col 15, ln 1-24); an engine for providing a promotion calendar (see col 8, ln 65-67; col 9, ln 1-28); and an engine for providing markdown item pricing (col 9, ln 40-67).

As per claim 2, Dvorak further teaches an econometric engine for determining demand coefficients and providing the determined coefficients to the optimization engine (col 9, ln 29-39).

As per claim 3, Dvorak further teaches a computer system on which the financial engine, econometric engine, and optimization engine are implemented (col 4, ln 16-25).

As per claim 4, Dvorak further teaches wherein the financial engine generates cost data (see col 6, ln 62-67 and col 7, ln 1-26).

As per claim 5, Dvorak further teaches a support tool with a graphic user interface for specifying markdown price constraints and providing the constraints to the optimization engine (see Fig 20 and col 30, ln 49-63).

As per claim 6, Dvorak further teaches the graphic user interface further comprises a graphical user interface for designating markdown items and setting markdown rules (see Fig 18 and 19; and col 30, ln 14-39).

As per claim 7, Dvorak further teaches the support tool allows the implementation of the plan (col 9, ln 29-39).

As per claim 24, Dvorak further teaches wherein the optimization engine provides relative optimized pricing by generating a price and promotion plan and then generating an optimized markdown plan based on the generated price and promotion plan (col 9, ln 40-67).

As per claim 25, Dvorak further teaches wherein the optimization engine manages conflicts between relative optimized pricing for markdown items and pricing and promotions for non-markdown items (col 9, ln 40-67).

As per claim 37, Dvorak teaches an apparatus for providing relative optimized pricing for markdown items (see col 9, ln 40-67), comprising: a financial engine for determining revenue for determining sales costs (see col 6, ln 62-67; col 7, ln 1-26; and col 9, ln 40-67); an optimization engine receiving input from the financial engine for using the determined sales costs and providing relative optimized pricing for markdown items (see col 6, ln 62-67; col 7, ln 1-26; and col 9, ln 40-67) and provides pricing and a promotion calendar for non-markdown items (see col 8, ln 65-67; col 9, ln 1-28).

As per claim 38, Dvorak further teaches an econometric engine for determining demand coefficients and providing the determined coefficients to the optimization engine (col 9, ln 29-39).

As per claim 39, Dvorak further teaches a computer system on which the financial engine, econometric engine, and optimization engine are implemented (col 4, ln 16-25).

As per claim 40, Dvorak further teaches wherein the financial engine generates cost data (see col 6, ln 62-67 and col 7, ln 1-26).

As per claim 41, Dvorak further teaches a support tool with a graphic user interface for specifying markdown price constraints and providing the constraints to the optimization engine (see Fig 20 and col 30, ln 49-63).

-- Please See Continuation Sheet--

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US 07/20678

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Box V. 2. Citations and explanations:

As per claim 42, Dvorak further teaches the graphic user interface further comprises a graphical user interface for designating markdown items and setting markdown rules (see Fig 18 and 19; and col 30, ln 14-39).

As per claim 43, Dvorak further teaches the support tool allows the implementation of the plan (col 9, ln 29-39).

Claims 8, 21 and 26-30 lack an inventive step under PCT Article 33(3) as being obvious over Dvorak as applied to claim 4 above and further in view of US 2003/0220830 A1 (Myr).

As per claim 8, Dvorak does not specifically describe wherein the support tool provides a tuning indicator that indicate when tune thresholds are met. However, Myr discloses wherein the support tool provides a tuning indicator that indicate when tune thresholds are met (see para [0194]-[0202]). It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Myr with Dvorak because including tuning or iterative updating of the price optimization increases the accuracy of the price markdown system.

As per claim 21, Dvorak does not specifically describe input for the econometric engine for receiving data on at least a weekly basis, wherein the econometric engine provides output to the optimization engine on at least a weekly basis and wherein the optimization engine revises the provided relative optimized pricing for markdown items on at least a weekly basis. However, Myr discloses input for the econometric engine for receiving data on at least a weekly basis, wherein the econometric engine provides output to the optimization engine on at least a weekly basis and wherein the optimization engine revises the provided relative optimized pricing for markdown items on at least a weekly basis (see para [0194]-[0202]). It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Myr with Dvorak because including tuning or iterative updating of the price optimization increases the accuracy of the price markdown system.

As per claim 26, Dvorak details a computer implemented method for providing pricing for markdown items and non-markdown items (see col 9, ln 40-67), comprising: collecting sales, cost, and competitive data from the plurality of stores; analyzing the collected sales, cost, and competitive data (see col 6, ln 62-67; col 7, ln 1-26; and col 9, ln 40-67); providing pricing and a markdown schedule for markdown items (see col 6, ln 62-67; col 7, ln 1-26; and col 9, ln 40-67) and pricing for non-markdown items (see col 8, ln 65-67; col 9, ln 1-28); Dvorak does not specifically describe analyzing on an at least weekly basis sales of the markdown items; tuning the markdown schedule based on the analyzing data collected on an at least weekly basis; and providing tuned markdown schedule. However, Myr discloses analyzing on an at least weekly basis sales of the markdown items (see para [0194]-[0202]); tuning the markdown schedule based on the analyzing data collected on an at least weekly basis (see para [0194]-[0202]); and providing tuned markdown schedule (see para [0194]-[0202]). It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Myr with Dvorak because including tuning or iterative updating of the price optimization increases the accuracy of the price markdown system.

As per claim 27, Myr discloses wherein analyzing on a weekly basis sales of promotional items (see para [0194]-[0202]); tuning the promotion schedule (see para [0194]-[0202]); and providing a tuned promotion schedule (see para [0194]-[0202]).

As per claim 28, Dvorak discloses wherein the providing pricing and the markdown calendar is performed after pricing of non-markdown items and promotion schedule has been optimized and uses the pricing of the non-markdown items and promotion schedule (see col 8, ln 65-67; col 9, ln 1-28).

As per claim 29, Dvorak discloses receiving user supplied markdown price constraints (see Fig 20 and col 30, ln 49-63).

As per claim 30, Myr discloses providing a tuning indicator, which indicates when tuning thresholds are met (see para [0194]-[0202]).

Claims 9-10, 16-17 and 23 lack an inventive step under PCT Article 33(3) as being obvious over Dvorak as applied to claim 4 above and further in view of US 2003/0200185 A1 to Huerta et al. (hereinafter Huerta).

As per claim 9, Dvorak does not specifically describe wherein the support tool allows the specification of restraint rules. However, Huerta discloses wherein the support tool allows the specification of restraint rules (see para [0041]). It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Huerta with Dvorak because allowing the specification of restraint rules allows the customization of the specific implementation of the price markdown system to the specific constraints needed for specific stores or groups of stores.

As per claim 10, Huerta further describes wherein the support tool further allows the specification of a hierarchy for the restraint rules (see para [0041]).

As per claim 16, Huerta further describes wherein the support tool allows the specification of product groups and a hierarchy wherein product hierarchy is dependent on the product group in which a product is placed and restraint rules are modified and applied according to the hierarchy (see para [0041]).

As per claim 17, Huerta further describes wherein the support tool further allows the specification of store clusters, so that the constraint rules are modified and applied according to product hierarchy and store cluster (see para [0041]).

— Please See Continuation Sheet—

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US 07/20678

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Box V. 2. Citations and explanations:

As per claim 23, Dvorak does not specifically describe storing rules. However, Huerta discloses computer readable code for storing a plurality of rules (see para [0041]); computer readable code for allowing the prioritization of the plurality of rules (see para [0041]); and computer readable code for relaxing at least one lower priority rule to allow a higher priority rule to become feasible. (see para [0041]). It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Huerta with Dvorak because allowing the specification of restraint rules allows the customization of the specific implementation of the price markdown system to the specific constraints needed for specific stores or groups of stores.

Claims 9 and 11-14 lack an inventive step under PCT Article 33(3) as being obvious over Dvorak as applied to claim 4 above and further in view of US 2006/0161504 A1 to Walser et al. (hereinafter Walser).

As per claim 9, Dvorak does not specifically describe wherein the support tool allows the specification of restraint rules. However, Walser discloses wherein the support tool allows the specification of restraint rules (see para [0010] and [0038]). It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Walser with Dvorak because allowing the specification of restraint rules allows the customization of the specific implementation of the price markdown system to the specific constraints needed for specific stores or groups of stores.

As per claim 11, Walser further describes wherein a restraint rule allows the specification of a minimum time period between markdowns (see para [0037]).

As per claim 12, Walser further describes wherein a restraint rule allows the specification of a minimum price reduction (see para [0037]).

As per claim 13, Walser further describes wherein a restraint rule allows the specification of a unique last digit to signify a markdown price reduction (see para [0010], cents position).

As per claim 14, Walser further describes wherein a restraint rule allows specification of markdown start and end dates for a markdown product (see para [0015]).

Claim 15 lacks an inventive step under PCT Article 33(3) as being obvious over Dvorak and Walser as applied to claim 14 above and further in view of US 2005/0096963 A1 to Myr et al. (hereinafter Myr2).

As per claim, 15 neither Dvorak nor Walser disclose wherein the restraint rules further allows specification of salvage value of a markdown product. However, Myr2 discloses wherein the restraint rules further allows specification of salvage value of a markdown product (see para [0056] and [0206]). It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Myr2 with Dvorak and Walser because specifying the salvage value allows prevents sale of the item below the salvage value in the price markdown system reduce losses during the markdown.

Claims 18-20 and 22 lack an inventive step under PCT Article 33(3) as being obvious over Dvorak as applied to claim 4 above and further in view of US 2003/0028437 A1 to Graeme et al. (hereinafter Graeme).

As per claim 18, Dvorak does not specifically describe wherein the support tool further allows the specification of a markdown budget constraint. However, Walser discloses wherein the support tool further allows the specification of a markdown budget constraint. (see para [0065] and [0094]). It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Graeme with Dvorak because allowing the specification of budget constraint maintains the price markdown system within budget saving funds.

As per claim 19, Walser further describes wherein the support tool further allows the specification of a prediction, which provides predicted sales a relative optimized pricing (see para [0094]).

As per claim 20, Walser further describes wherein the support tool further allows the collection of data after the specification of a prediction and determining and displaying on the support tool a degree of difference between the collection of data after the specification of a prediction and the prediction (see para [0094] and [0095]).

As per claim 22, Walser further describes wherein the optimization engine receives data related to in-store and warehouse inventory levels and uses the in-store and warehouse inventory levels to determine markdown prices (see para [0094]).

Claims 31-32 lack an inventive step under PCT Article 33(3) as being obvious over Dvorak and Myr as applied to claim 26 above and further in view of Huerta.

As per claim 31, neither Dvorak nor Myr specifically describe receiving user supplied constraint rules. However, Huerta discloses receiving user supplied constraint rules (see para [0041]). It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Huerta with Dvorak and Myr because allowing the specification of restraint rules allows the customization of the specific implementation of the price markdown system to the specific constraints needed for specific stores or groups of stores.

— Please See Continuation Sheet—

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US 07/20678

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Box V. 2. Citations and explanations:

As per claim 32, Huerta further describes wherein the support tool further wherein the constraint rules have a user defined hierarchy (see para [0041]).

Claims 31, 33-35 lack an inventive step under PCT Article 33(3) as being obvious over Dvorak and Myr as applied to claim 26 above and further in view of Walser.

As per claim 31, neither Dvorak nor Myr specifically describe receiving user supplied constraint rules. However, Walser discloses receiving user supplied constraint rules (see para [0041]). It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Walser with Dvorak and Myr because allowing the specification of restraint rules allows the customization of the specific implementation of the price markdown system to the specific constraints needed for specific stores or groups of stores.

As per claim 33, Walser further describes wherein a restraint rule allows the specification of a minimum price reduction (see para [0037]).

As per claim 34, Walser further describes wherein a restraint rule allows the specification of a unique last digit to signify a markdown price reduction (see para [0010] cent position).

As per claim 35, Walser further describes wherein a restraint rule allows specification of markdown start and end dates for a markdown product (see para [0015]).

Claims 36 lack an inventive step under PCT Article 33(3) as being obvious over Dvorak, Myr, and Walser as applied to claim 31 above and further in view of Myr2.

As per claim, 36 neither Dvorak, Myr nor Walser disclose wherein the restraint rules allows specification of salvage value of a markdown product. However, Myr2 discloses wherein the restraint rules allows specification of salvage value of a markdown product (see para [0056] and [0206]). It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Myr2 with Dvorak, Myr and Walser because specifying the salvage value allows prevents sale of the item below the salvage value in the price markdown system reduce losses during the markdown.

Claims 1-43 have industrial applicability as defined by PCT Article 33(4), because the subject matter can be made or used in industry.



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Price management is costly, but well worth the investment

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By Emily Kay

Two weeks after launching a multi-million-dollar price-optimization project, Northern Group Retail Ltd. achieved \$60,000 additional gross margin on one product by replacing a hunch with technology. The 278-store Canadian apparel retailer would have typically reduced the price of winter outerwear by 30% during the 2002 holiday shopping season, but instead followed the recommendation of its ProfitLogic Pricing4Profit price-optimization software and kept the merchandise at full price.

"Traditionally, companies mark down items before Christmas," says Antony Karabus, chief executive of Karabus Management Inc., a retail consulting firm based in Toronto, Ontario, Canada, that helped Northern deploy Pricing4Profit. "The system told them, based on consumer demand, to sell at full price. They trusted the system and got a much more meaningful margin."

The technology employs "advanced statistical modeling, forecasting, data mining, pattern recognition, and optimization techniques" that help companies determine how to achieve merchandising, financial and operational goals, says Greg Girard, vice president of retail strategies with AMR Research Inc., Boston.

The "science" of price optimization is replacing what has been an "art form," says Eric Mitchell, president of the Professional Pricing Society in Atlanta, Ga.

Implementation and adoption challenges

Software that lets companies optimize pricing to maximize revenues and profits is not new. Airlines first employed it to maximize profits by modifying seat prices on flights. Yet, despite airlines' and a handful of retailers' successes, retail-specific technology is relatively new. ProfitLogic, DemandTec Inc., KhlMetrics Inc., and Spotlight Solutions Inc. sales account for more than 80% of the nascent market, according to Girard.

That the software goes by several different names—including retail merchandise optimization, price optimization, enterprise profit optimization, margin optimization, and demand and revenue management—may help explain the lack of widespread deployment. AMR, for example, groups price-optimization functionality under "retail revenue management." To Karabus, "merchandise optimization"—which he says describes the new breed of dynamic, predictive software that fosters decision-making based on current customer demand patterns—represents the most proven of several emerging optimization systems that include promotional planning, initial price optimization, assortment planning, replenishment and allocation.

"There are definitely organizations we run into where there's confusion at first glance," concedes Garrett Sindlar, vice president of marketing and strategic initiatives with Spotlight Solutions in Mason, Ohio. Additionally, drug store and grocery chains, which offer products with long life cycles, require different solutions than apparel retailers, mass merchants and computer manufacturers, all of which sell products with short life cycles. Cambridge, Mass.-based ProfitLogic, for example, offers software that helps retailers mark down non-negotiated prices for seasonal items such as Halloween candy. Metreo Inc. aids industrial manufacturers in optimizing negotiated pricing for industrial products such as electrical control and power distribution equipment, says Daphne Cameli, co-founder, president, and CEO of Metreo in Palo Alto, Calif.

Such systems don't function in a vacuum. They must tightly interoperate with purchasing, replenishment and other enterprise and supply chain operations, says Kevin Scott, an AMR senior research analyst. Pricers also need access to at least two years of historical, accurate and timely data on sales, pricing, inventory and margin, adds Todd Hassell, manager of retail revenue management solutions with BearingPoint Inc., a business consulting and integration firm in McLean, Va.

The challenges of implementing the technology, however, are secondary to organizational, process and change-management issues. "It's not about systems implementation; that's the easier part," says Karabus. "It's more about change management, changing processes and rules and getting people to buy in to how they do business will change, how their roles will change, and that a powerful machine is better at analyzing huge mounds of data than any human being can be."

To be sure, organizations in which merchants traditionally make decisions may resist strategic pricing projects. "There's a lot of reluctance to hand over at least part of the decision-making process to software applications because merchants feel they're the experts and they've been doing it for years," says Hassell.

Companies dealing with a poor economy may also shy away from buying price-optimization software from small, privately funded suppliers with little real-world experience. "Coming out of the 'dot bombs' and with other companies no longer in business," skepticism is natural, says a marketing executive with a global airfreight company who declines to be identified.

More established vendors Manugistics Group Inc. and I2 Technologies Inc. offer their own price-optimization solutions. Keenly aware of the smaller suppliers' successes, other mature applications players are sure to join the fray. "There's a lot of interest from major software firms such as PeopleSoft, SAP, and SAS Institute," says Mitchell.

With so many startups actively selling, and larger suppliers eyeing the market, a shakeout is likely. "We've seen increased interest among venture companies and larger application companies to acquire smaller vendors," says Girard. "A consolidation is inevitable." A sizeable, unnamed applications vendor considers KhlMetrics in Scottsdale, Ariz., and Spotlight Solutions to be attractive acquisition targets, notes Girard, who adds that such activity exacerbates risk when companies "combine architectures and products."

Linking beneficial contracts is one way to avoid potential pitfalls of buying solutions from less established vendors. The airfreight firm, for example, insisted on sharing risks and gains with its supplier, and ensured it would eventually own the software.

The next big thing

These days, companies increasingly recognize the need for top-line results, which they can't achieve with current price-setting approaches. The enormous amounts of available information and its sources are growing so fast that company analysts and sales managers must replace spreadsheets with price-optimization technology, says Scott. "Without a centralized database and repository of rules, it would be impossible to successfully manage [demand management, yield management or price/order management], let alone all three," he states.

Even merchants skeptical of handing over decision-making to software recognize the enormity of the pricing challenge. Before Hewlett-Packard Co.'s North American Unix Server Group deployed Rapt Inc.'s Price Director, product managers and pricing analysts used spreadsheets to support pricing strategies involving thousands of configurations for hundreds of hardware products. To enhance profits and boost market share, the company needed a more sophisticated approach to devising pricing strategies for existing products before introducing new ones and linking anticipated buyer behavior with product lines throughout the supply chain.

"We had no way to really understand the customer's response to pricing, go to the next level to optimize pricing and fine tune it, and be more strategic in the timing of our pricing decisions," says Monica Lasgoly, HP's senior financial analyst of business critical systems for the Americas in

Cupertino, Calif.

While the \$1 million to \$5 million price tag for price-optimization projects is daunting, some observers believe such solutions would be less popular in a better economy because companies have done all they can to enhance their supply chains by cutting costs. "When the market tanks, companies completely retrench and cut costs as far as they can be cut," says Carmeli. "When they think about the top line, that's where price comes in. Price is the number one profit lever in any company."

Several studies show "a 1% improvement in price drives a 7.5% improvement in profit and a 1% improvement in inventory management drives about a 3% improvement in profit," Carmeli adds. In a sound economy, many companies "wouldn't be focused on price nearly as much with this kind of aggressiveness, and would not have made price a strategic imperative."

AMR's Scott confirms that few companies other than airlines and hotels even considered pricing software two years ago. "Now, after a few early implementations estimating returns in the millions," he says, "companies are looking at pricing applications as a way to do the unthinkable in a sluggish economy: Grow profits by increasing revenue, not cutting costs."

Software suppliers are enjoying the fruits of such interest. Since the start of the year, demand and revenue management products represent one third of Manugistics' \$310.1 million business, says Neil Hooper, the company's group vice president of demand and revenue management in Rockville, Md. "A lot of this is new sales activity, but it is an enormous shift," he says. "It's the hottest thing we have going right now."

Vendors report a slew of potential customers. Claiming six active customers including ShopKo Stores Inc., Sinclair says 20 additional retailers are evaluating Spotlight's software. ProfitLogic, which boasts nine big-name, operational customers including J.C. Penney Co. Inc., Gap Inc., Bloomingdale's Inc., and The Home Depot Inc., expects to announce five new customers in the fourth quarter, says Scott Friend, the firm's vice chairman and president.

Independent analysts' findings support the escalating appeal of priceoptimization solutions. AMR projects that the retail revenue management software will explode from \$75 million in 2002 to \$500 million by 2005 and \$900 million by 2007. "Revenue management is poised to be an integral part of the next technology boom," says Scott. And while only 12% of respondents in a recent BearingPoint/National Retail Federation Foundation study say they use markdown-optimization software, 53% plan to deploy it within two years.

Quick ROI

Though few companies publicly discuss their price-optimization projects, it's clear that such technology can deliver tangible advantages. "It's incredible software. No software out there gets ROI this fast," says Karabus, who notes that companies can implement the software within 16 weeks and attain full payback within 12 months.

In a 10-week price-optimization trial involving six categories in 30 stores for a total of 1,600 SKUs, Longs Drug Stores Corp. deployed DemandTec 3 Price and Promotion to improve sales dollars 1.9% and enhance gross profit 5.1%, according to DemandTec. Published reports indicate that Spotlight's Markdown Optimizer helped \$3.2 billion ShopKo post a 25% increase in gross margin dollars on markdown items during a software pilot.

While such gains are impressive, observers caution companies to maintain realistic expectations about how quickly the software can deliver benefits. "We saw improvements within two to three weeks, but not what we were hoping for," says the airfreight company's marketing manager.

Other variables, such as the economy, can wreak havoc on estimated results. Published accounts of HP increasing revenues by \$15 million per quarter through better pricing decisions were too aggressive "because the whole economy's tanked since then," says Lasgoly. "That was an estimate for a worldwide number two years ago so we're not saying that now," she says.

Lasgoly expects that Price Director will still help HP achieve the same percentage return on revenues. She also believes that, while price-optimization projects are especially costly in today's economy, "the benefits, every step of the way, are well worth it."